UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

MEMORANDUM:

To: Kable Davis

From: Eric Bohnenblust, Ph.D., Entomologist

Secondary Review: Jennifer Saunders, Ph.D., Senior Entomologist

Date: December 5, 2016

Subject: PRODUCT PERFORMANCE DATA EVALUATION RECORD (DER)

THIS DER DOES NOT CONTAIN CONFIDENTIAL BUSINESS INFORMATION

Note: MRIDs found to be **unacceptable** to support label claims should be removed from the data matrix.

DP barcode: 417707
Decision no.: 487110
Submission no: 946033
Action code: 570
Product Name: Deltamethrin 4% Collar
EPA Reg. No or File Symbol: 68451-1
Formulation Type: Dog Collar
Ingredients statement from the label with PC codes included:
Deltamethrin 4.0% PC: 097805
Application rate(s) of product and each active ingredient (lbs. or gallons/1000 square feet or per acre as appropriate; and g/m^2 or mg/cm^2 or mg/kg body weight as appropriate): 1 collar per dog, cut off 2 inches from collar buckle and dispose of excess collar, 1 collar lasts 6 months
Use Patterns: Dog collar to control fleas, ticks, and mosquitoes for 6 months

I. Action Requested: Review one MRID submitted to support efficacy against *Aedes aegypti* and *Anopheles quadrimaculatus* mosquitoes for the EPA Reg. No. 68451-1.

II. Background: The registrant submitted one MRID in response to an Agency letter dated March 21, 2012 to support efficacy against *Aedes aegypti* and *Anopheles quadrimaculatus* mosquitoes for the subject product. Per the Agency letter, the registrant had data showing efficacy of the product against *Culex pipiens.* Based on the review of the previously submitted data (DP: 396235), data were acceptable to support anti-feedant/repellent claims for 27 weeks pending the review of data for two additional species, but only 60% mortality was observed and claims of kills mosquitoes are not supported.

III. MRID Summary:

49271801.Repellency and Efficacy of Scalibor Protector Bands for Dogs Against Concurrent Challenge of Aedes Aegypti and Anopheles Quadrimaculatus (Diptera: Culicidae) Mosquitoes.

(1) GLP with the exception of feed and water analyses.

(2) **Methods:** This study evaluated the repellency and efficacy of Scalibor Protector bands for dogs containing 4% deltamethrin w/w and a placebo band against *Aedes aegypti* and *Anopheles quadrimaculatus* for up to 6 months. There were ten individual dogs per treatment, and dogs were blocked based on the number of fed mosquitoes from the initial mosquito challenge performed on day -7. Collars were placed on dogs on day 0 according to label directions. Dogs were sedated and placed in cages with 50 each of unfed female *Ae. aegypti* and *An. quadrimaculatus* on days 7, 28, 84, 112, 140, and 168 post application of the collar. Dogs were exposed to mosquitoes for one hour. After one hour, all mosquitoes were removed from the cages and determined to be alive or dead. Dead mosquitoes were checked to determine if they took a blood meal. Live mosquitoes were counted and killed using CO_2 or freezing and within 30 hours were assessed for the presence of blood in their abdomen. The percentage of unfed mosquitoes was determined using the ratio of unfed mosquitoes over the total number of mosquitoes recovered for each dog. Repellency was assessed as the percent of unfed mosquitoes exposed to treated dogs compared to the percent of unfed mosquitoes on untreated dogs. Efficacy was assessed as the mean number of live mosquitoes on treated dogs versus untreated dogs. The study sponsor reported both arithmetic and geometric means. The Agency used arithmetic means to assess efficacy.

(3) **Results:** The maximum reduction of live *Ae. aegypti* on treated dogs during any observation point was 78%. The percent of *Ae. aegypti* repelled from dogs in the collar treatment was typically between 9-16% when compared to the control treatment. At all observation dates, about 60-85% of *Ae. aegypti* did not feed on dogs treated with the placebo collar. Mortality of *Ae. aegypti* in the control cages ranged from 42-80%. The number of live *An. quadrimaculatus* was reduced by of 78.2%, 78.7%, 53.6%, 85.5%, 83.2%, 89.0%, and 84.2% on Days 7, 28, 56, 84, 112, 140, and 168, respectively. The percent of *An. quadrimaculatus* repelled from dogs in the collar treatment was typically between 8-20% when compared to the control treatment. At all observation dates, about 42-76% of *An. quadrimaculatus* did not feed on dogs treated with the placebo collar. Mortality of *An. quadrimaculatus* in the control cages ranged from 50-82%.

(4) **Conclusion: Unacceptable.** This study does not support efficacy claims against mosquitoes. None of the measures of efficacy ever reached 90% and mortality of both mosquito species in the control treatment was very high. For future studies, dogs initially should be challenged with mosquitoes within 24 hours of collar application.

IV. EXECUTIVE DATA SUMMARY:

(A) The submitted data do not support efficacy claims against mosquitoes. For any claims against mosquitoes, the Agency requires acceptable efficacy data against at least one species from each of the following genera: *Aedes*, *Anopheles*, and *Culex*. For more information on the specific mosquito species acceptable for testing please see https://www.epa.gov/pesticide-registration/guidance-efficacy-testing-pesticides-targeting-certain-invertebrate-pests.

V. LABEL RECOMMENDATIONS:

(1) No changes to the directions for use are necessary.

(2) The following marketing claims are acceptable:
All previously approved claims for pests other than mosquitoes are acceptable.

(3) The following marketing claims are unacceptable:
Repels mosquitoes for up to six months.
Reduces mosquito bites for up to six months.
Reduces blood feeding by mosquitoes for up to six months.
Protects against mosquito bites for up to six months.

(4) The following MRIDs should be removed from the data matrix, as they are classified as “unacceptable” to support the product: 49271801